



ClareVision Network Video Recorder Installation Guide

Model CV-M321620-08



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Version	This document applies to CV-M32810-08 ClareVision Network Video Recorder Rev 2.0.
Contact information	For contact information, see www.clarecontrols.com .

Note: The figures shown in this manual are for reference only. The appearance and interface of the device are subject to the actual model.

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Package contents

- 1 X 32 channel NVR appliance
- 1 X AC power cord
- 1 X optical mouse
- 1 X remote control
- 2 X rack mount ears
- 16 X mounting screws
- 1 X SATA hard drive cable

NVR pre-installation

This NVR is highly advanced surveillance equipment that should be installed with care. Please take into consideration the following precautionary steps before installation of the NVR.

- Keep all liquids away from the NVR.
- Install the NVR in a well-ventilated and dust-free area.
- Ensure environmental conditions meet factory specifications.
- Install a manufacturer recommended HDD.

NVR installation

When installing the NVR:

- Use brackets for rack mounting.
- Ensure that there is ample room for audio and video cables.
- When routing cables, ensure that the bend radius of the cables is no less than five times its diameter.
- Connect both the alarm and RS-485 cable. (Optional)
- Allow at least .75 in. (2 cm) of space between racks mounted devices.
- Ensure the NVR is grounded.
- Environmental temperature should be within the range of 14 to 131 °F (-10 to 55 °C).
- Environmental humidity should be within the range of 10 to 90%.

Hard disk installation (optional)

Additional SATA hard disks can be installed in your NVR. Disconnect the power from the NVR before installing a hard disk drive (HDD). A factory recommended HDD should be used for this installation.

Up to 8 SATA hard disks can be installed on your NVR.

Tools required: Philips head screwdriver.

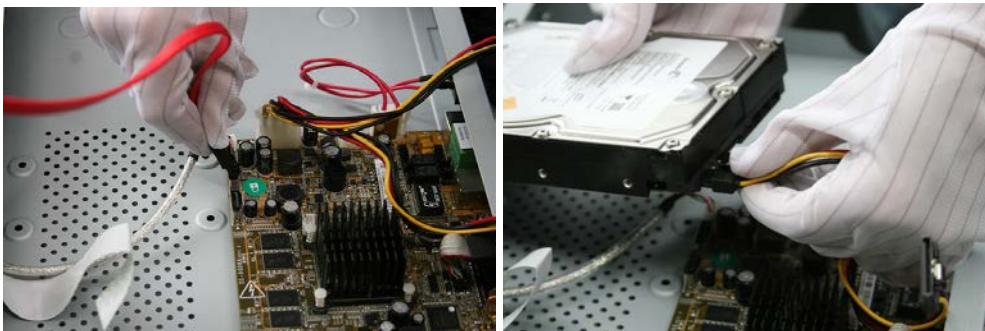
To install the hard disk drive into the NVR:

1. Remove the cover from the NVR by unfastening the screws on the back and side panel.

When installing a SATA hard disk drive, we recommend that the installer wear anti-static gloves and a grounding wrist-strap.



2. Connect one end of the data cable to the motherboard of the NVR and the other end to the HDD.



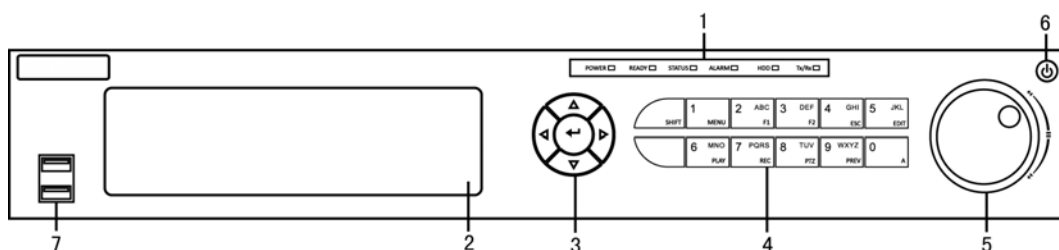
3. Connect the power cable to the HDD.



4. Place the HDD on the bottom of the device, and then fasten the screws on the bottom to attach the HDD.



Front panel

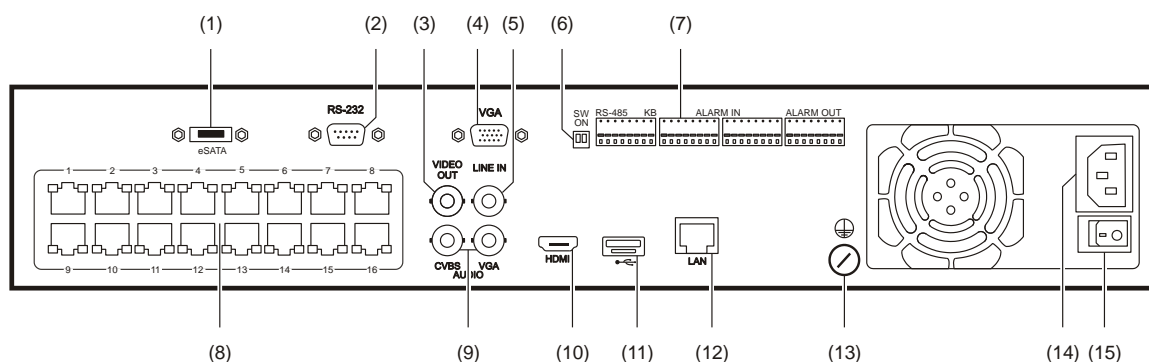


No.	Name	Setting	Function Description
1	Status indicators	POWER	Turns green when NVR is powered up.
		READY	The LED is green when the device is running normally.
		STATUS	The light is green when the IR remote control is enabled.
			The light is red when the function of the composite keys (SHIFT) are used.
			The light is out when none of the above conditions are met.
		ALARM	The light is red when there is an alarm occurring.
		HDD	Blinks red when HDD is reading/writing.
		Tx/Rx	Blinks green when network connection is functioning normally.
2	DVD-R/W		Slot for DVD-R/W
3	Control buttons	DIRECTION	In Menu mode, the direction buttons are used to navigate between different fields and items and select setting parameters.
			In Playback mode, the Up and Down buttons are used to speed up and slow down record playing, and the Left and Right buttons are used to move the recording 30s forwards or backwards.
			In the image setting interface, the Up and Down button can adjust the level bar of the image parameters.
			In Live View mode, these buttons can be used to switch channels.
		ENTER	The Enter button is used to confirm selection in menu mode; or used to check checkbox fields and ON/OFF switch.
			In Playback mode, it can be used to play or pause the video.
			In Single-frame Play mode, pressing the Enter button will play the video by a single frame.
			In Auto Sequence View mode, the buttons can be used to pause or resume auto sequence.

No.	Name	Setting	Function Description
4	Composite keys	SHIFT	Switch between the numeric or letter input and functions of the composite keys. (Input letter or numbers when the light is out; Realize functions when the light is red.)
		1/MENU	Enter the numeral "1" Access the main menu interface.
		2/ABC/F1	Enter the numeral "2".
			Enter the letters "ABC".
			The F1 button when used in a list field will select all items in the list.
		3/DEF/F2	In PTZ Control mode, it will turn on/off PTZ light and when the image is zoomed in, the key is used to zoom out.
			Enter the numeral "3".
			Enter the letters "DEF".
			The F2 button is used to change the tab pages.
		4/GHI/ESC	In the PTZ control mode, it zooms in the image.
			Enter the numeral "4".
			Enter the letters "GHI".
		5/JKL/EDIT	Exit and back to the previous menu.
			Enter the numeral "5".
			Enter the letters "JKL".
			Delete characters before cursor.
			Check the checkbox and select the ON/OFF switch;
		6/MNO/PLAY	Start/stop record clipping in playback.
			Enter the numeral "6".
			Enter the letters "MNO".
		7/PQRS/REC	Playback, for direct access to playback interface.
			Enter the numeral "7".
			Enter the letters "PQRS".
		8/TUV/PTZ	Open the manual record interface.
			Enter the numeral "8".
			Enter the letters "TUV".
			Access the PTZ control interface.
		9/WXYZ/PREV	Enter the numeral "9".
			Enter the letters "WXYZ".
			Multi-channel display in live view.
		0/A	Enter the numeral "0".
			Shift the input methods in the editing text field. (Upper and lowercase, alphabet, symbols or numeric input).
			Double press the button to switch the main and auxiliary output.

No.	Name	Setting	Function Description
5	JOG SHUTTLE control		<p>Move the active selection in a menu. It will move the selection up and down.</p> <p>In Live View mode, it can be used to cycle through different channels.</p> <p>In the Playback mode, it can be used to jump 30 seconds forward/backward in video files.</p> <p>In the PTZ control mode, it can control the movement of the PTZ camera.</p>
6	POWER ON/OFF		Power on/off switch.
7	USB interfaces		Universal Serial Bus (USB) ports for additional devices such as USB mouse and USB Hard Disk Drive (HDD).

Rear panel



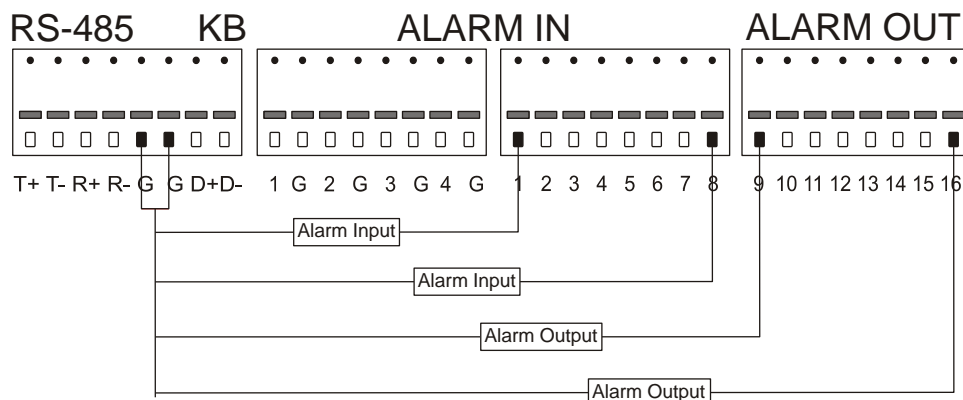
No.	Item	Description
1	eSATA (Optional)	Connects an external hard drive.
2	RS-232 Interface	Connector for the RS-232 devices.
3	VIDEO OUT	BNC connector for the video output.
4	VGA	VGA output 15 pin connector. Displays the local video output and the menu.
5	LINE IN	BNC connector for the audio input.
6	Termination Switch	RS-485 termination switch. The up position is not terminated. The down position is terminated with 120 Ω resistance.
7	RS-485 Interface	Connector for the RS-485 devices. The T+ and T- pins connect to the R+ and R- pins of the PTZ receiver respectively.
	Controller Port	The D+, and the D- pin connects to the Ta, and the Tb pin of the controller. For cascading devices, the first NVR's D+, D- pin should be connected with the D+, D- pin of the next NVR.
	ALARM IN	Connector for alarm input.
	ALARM OUT	Connector for alarm output.
8	Network Interfaces with PoE function	Network interfaces for the cameras and to provide power over Ethernet (PoE).
9	CVBS AUDIO OUT	BNC connector for the audio output. This connector is synchronized with the CVBS video output.
	VGA AUDIO OUT	BNC connector for the audio output. This connector is synchronized with the VGA video output.
10	HDMI	HDMI video output for the connector.
11	USB interface	Universal Serial Bus (USB) ports for additional devices such as USB mouse and USB Hard Disk Drive (HDD).
12	LAN Interface	One network interface provided.
13	GROUND	Ground (must be connected when the NVR starts.)
14	AC 100 V to 240 V	AC 100 V to 240 V power supply.
15	POWER	Switch for turning the device on/off.

Peripheral connections

Wiring of alarm input

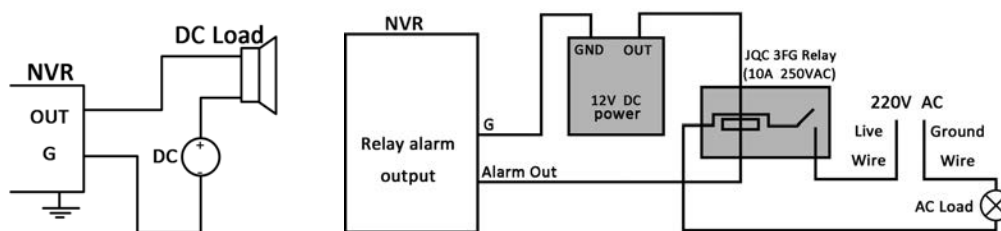
The alarm input is an open/closed relay. To connect the alarm input to the device, use the following diagram.

Note: If the alarm input is not an open/close relay, connect an external relay between the alarm input and the device.



Wiring of alarm output

To connect to an alarm output (AC or DC load), use the following diagram.



DC Load Connection Diagram

AC Load Connection Diagram

For the DC load, the jumpers can be used within the limit of 12V/1A safely.

To connect an AC load, jumpers should be left open (you must remove the jumper on the motherboard in the NVR). Use an external relay for safety (as shown in the figure above).

There are four jumpers (JP1, JP2, JP3, and JP4) on the motherboard, each corresponding to one alarm output. By default, jumpers are connected. To connect an AC load, the jumpers should be removed.

Example:

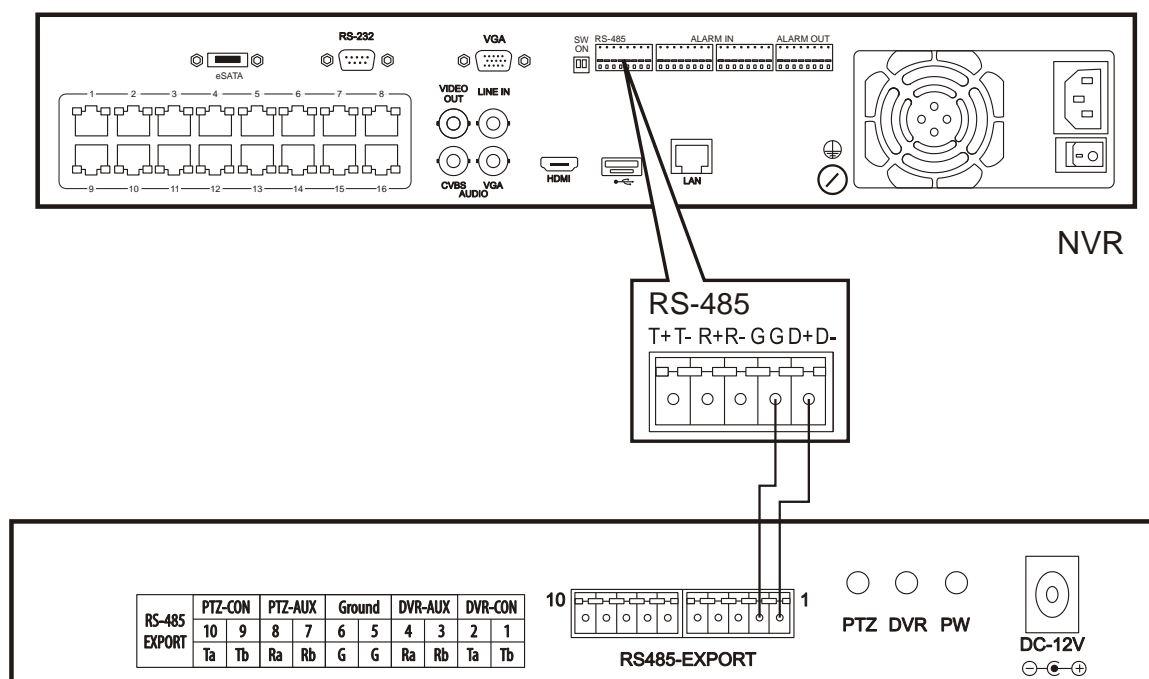
If you connect an AC load to the alarm output 3 of the NVR, then you must remove the JP3 jumper.

Using of alarm connectors

To connect alarm devices to the NVR:

1. Disconnect the terminal block from the ALARM IN /ALARM OUT port.
2. Unfasten the stop screws from the terminal block, insert the signal cables into the slots, and then fasten the stop screws. Ensure the signal cables are tight.
3. Connect the terminal block back into the port.

Controller connection



To connect a controller to the NVR:

1. Disconnect the terminal block from the port.
2. Unfasten the stop screws from the D+, D- terminal block, insert the signal cables into the slots, and then fasten the stop screws. Ensure the signal cables are in tight.
3. Connect Ta on the controller to D+ on the terminal block and Tb on the controller to D- on the terminal block. Fasten the stop screws.
4. Connect the terminal block back into the port.

Note: Make sure both the controller and NVR are grounded.

HDD storage calculation chart

The following chart shows an estimation of storage space used based on recording at one channel for an hour at a fixed bit rate.

Table 1: Storage calculation chart

Bitrate	Storage Used
96 K	42 M
128 K	56 M
160 K	70 M
192 K	84 M
224 K	98 M
256 K	112 M
320 K	140 M
384 K	168 M
448 K	196 M
512 K	225 M
640 K	281 M
768 K	337 M
896 K	393 M
1024 K	450 M
1280 K	562 M
1536 K	675 M
1792 K	787 M
2048 K	900 M
4096 K	1800 M
8192 K	3600 M
16384 K	7200 M

Note: The values supplied for the storage space used is only for reference. The storage values in the chart are estimated by formulas and may be different from the actual value.

Menu operation

Startup and shutdown

Proper startup and shutdown procedures are crucial to expanding the life of the NVR.

To start your NVR:

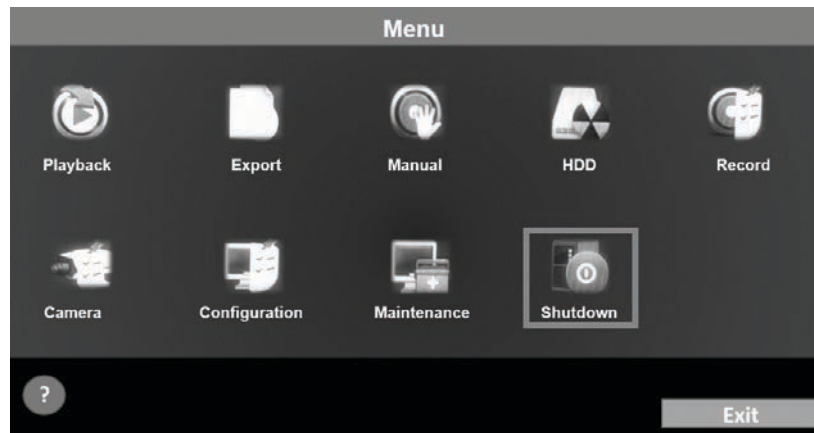
1. Connect to a monitor using VGA or HDMI.
2. Check that the power supply is plugged into an electrical outlet, and then flip the rear power switch to ON.

We highly recommend that you use an Uninterruptible Power Supply (UPS) in conjunction with the device.

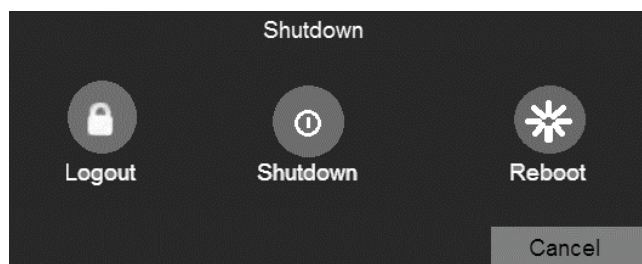
3. Press the POWER button on the front panel. The Power LED turns green as the unit starts.

To shut down the NVR:

1. Enter the Shutdown menu (**Menu > Shutdown**).



2. Select **Shutdown**.



3. Click **Yes**.

Using the Setup Wizard

By default, the Setup Wizard starts once the NVR has loaded.

To operate the Setup Wizard:

1. The Setup Wizard can walk you through some important settings of the NVR. If you don't want to use the Setup Wizard at this time, click **Cancel**. You can also choose to use the Setup Wizard the next time by selecting the **Start wizard when device starts?** checkbox.



2. Click **Next** on the Wizard window to enter the Login window.

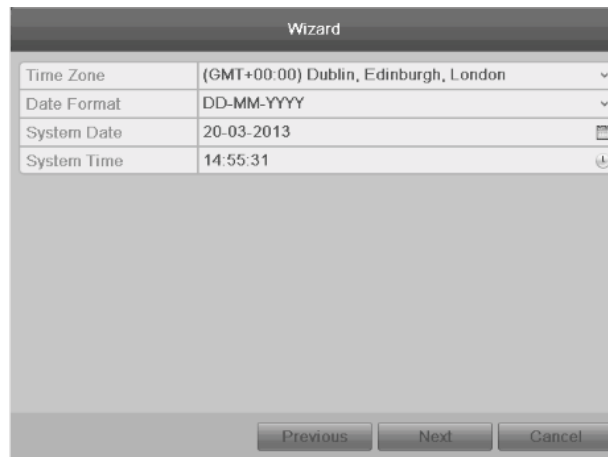


3. Enter the admin username and password. The default username is "clareadmin"; the default password is "secure7".
4. To change the admin password, select the **New Admin Password** checkbox. Enter the new password and confirm the password in the given fields.

Note: We strongly recommend changing the admin password on initial use. Record this password in a safe place, if lost the NVR will require a factory reset.

5. Click **Next** to enter the date and time settings window.

6. Enter the correct time zone, date, and time for your location in their corresponding fields.

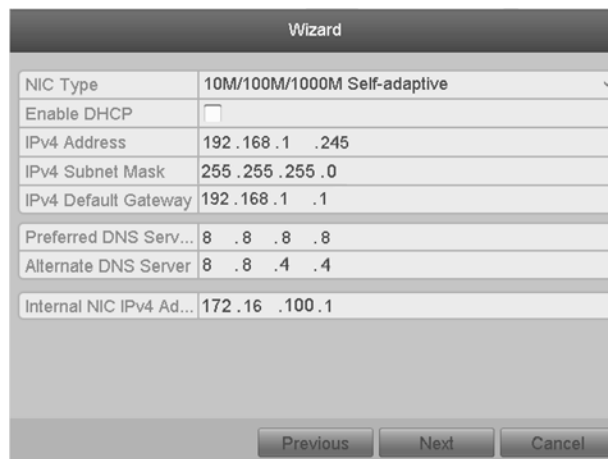


The Wizard window displays time configuration options. The fields are as follows:

Field	Value
Time Zone	(GMT+00:00) Dublin, Edinburgh, London
Date Format	DD-MM-YYYY
System Date	20-03-2013
System Time	14:55:31

Navigation buttons: Previous, Next, Cancel.

7. After the time settings, click **Next** to enter the Network Setup window.



The Wizard window displays network configuration options. The fields are as follows:

Field	Value
NIC Type	10M/100M/1000M Self-adaptive
Enable DHCP	<input type="checkbox"/>
IPv4 Address	192.168.1.245
IPv4 Subnet Mask	255.255.255.0
IPv4 Default Gateway	192.168.1.1
Preferred DNS Serv...	8.8.8.8
Alternate DNS Server	8.8.4.4
Internal NIC IPv4 Ad...	172.16.100.1

Navigation buttons: Previous, Next, Cancel.

The internal NIC IPv4 address should be configured for the cameras connecting to the PoE network interface of the NVR.

8. Click **Next** to enter the HDD Management window.



The Wizard window displays HDD management options. The table shows the following information:

	Capacity	Status	Property	Type	Free Space
<input checked="" type="checkbox"/> 1	465.76GB	Normal	R/W	Local	465GB

Navigation buttons: Previous, Next, Cancel. An 'Init' button is also present.

9. To initialize the desired HDD, click **Init**. Initialization removes all the data saved in the HDD.

Note: The HDDs are initialized in the factory and are ready to record out of the box.

10. Click **Next**. You will enter the Adding IP Camera interface.

11. Click **Search** to find online IP Camera.

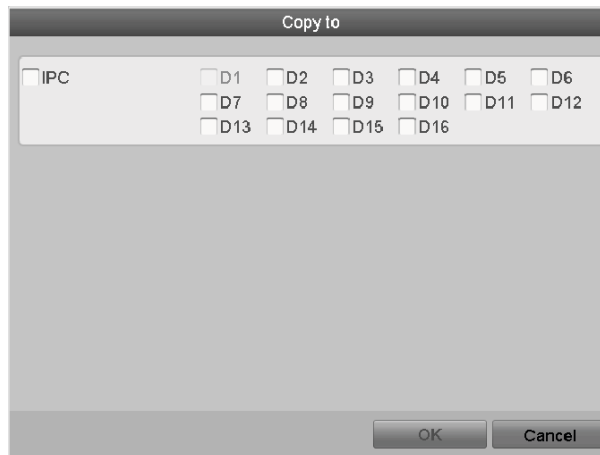
12. Select the IP camera to be added, and then click **Add**.



13. Click the **Next** button. Configure the recording settings for the searched IP Cameras.



14. Click **Copy** to copy the settings to other channels.



15. Click **OK** to complete the Setup Wizard and return to Live View.

Live View

Some icons are provided on the screen in Live View mode to indicate different camera status. Icons appear at the top right of the screen for each channel. They show the status of the record and alarm in the channel so that you can identify problems quickly.

Table 2: Live View icons

Icon	Description
	Alarm (video loss, tampering, motion detection or sensor alarm)
	Record (manual record, schedule record, motion detection or alarm triggered record)
	Alarm & Record

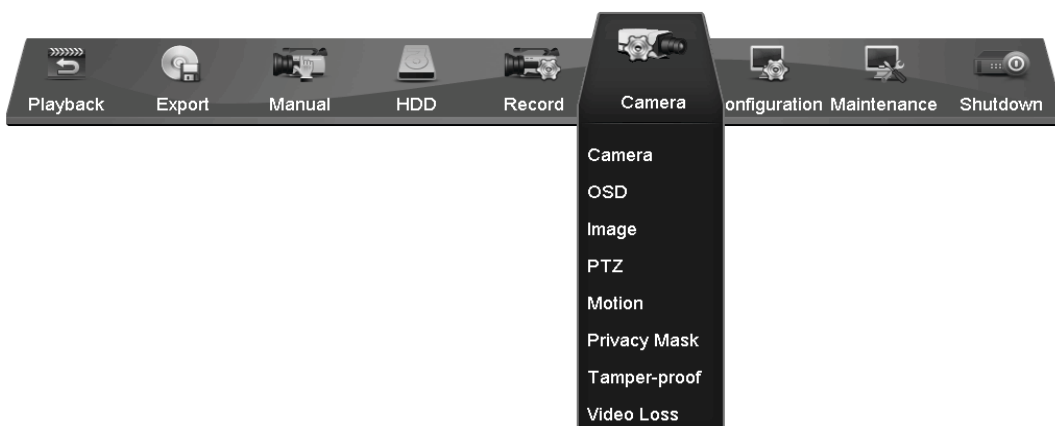
Adding and configuring IP cameras

Add and configure the online IP cameras to enable the Live View and recording function.

You can search and add the online IP cameras by following the Startup wizard, or by following these steps.

To add IP cameras:

1. Right click to enter the Camera Management interface (**Menu > Camera > Camera**).



To add the online cameras with same network segment:

1. Click **Search** to search the online cameras.



2. Select the checkboxes for the cameras to be added.
3. Click **Quick Add** to add the cameras.




To add other IP cameras:

1. In the left side of the window, enter the IP address, protocol, management port, and other information for the IP camera.
2. Click **Add** to add the camera.


Configuring basic parameters of IP cameras

After the adding the IP camera, the basic information displays on the page. You can configure the basic parameters of the IP camera.

Table 3: Basic icons

Icon	Description
	Edit basic parameters of the camera
	Delete the IP camera
	Get the live view of the camera

To configure basic parameters:

1. Click the  icon to edit the parameters. You can edit the IP address, protocol, and other parameters.



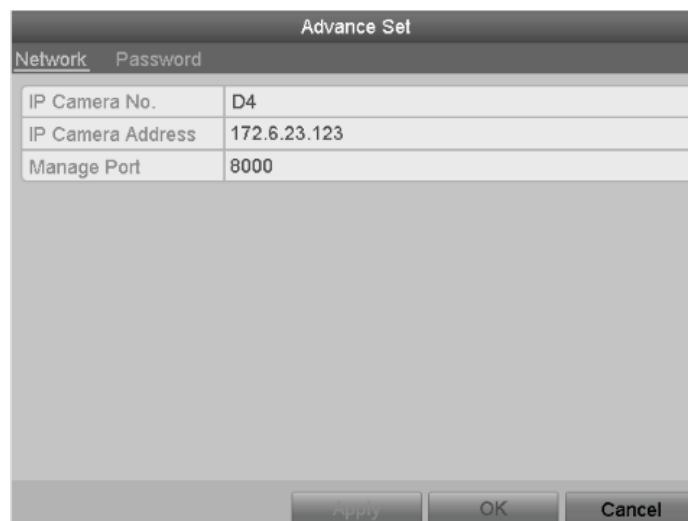
Edit IP Camera	
IP Camera No.	D2
IP Camera Address	172.6.21.221
Protocol	ONVIF
Manage Port	80
Channel No.	1
User Name	admin
Admin Password	

Apply OK Cancel

2. Click **Apply** to save the settings, and then click **OK** to exit the editing interface.

To edit more parameters:

1. Click the **Advance Set** icon.



Advance Set	
Network Password	
IP Camera No.	D4
IP Camera Address	172.6.23.123
Manage Port	8000

Apply OK Cancel

2. You can edit the network information and the password of the camera.
3. Click **Apply** to save the settings, and then click **OK** to exit the interface.

PTZ control

Before you begin, ensure the PTZ is properly connected to the NVR through the RS-485 interface.

PTZ settings

To set PTZ:


1. Enter the PTZ Settings interface (**Menu > Camera > PTZ**).

General More Settings	
Camera	IP Camera 2
Baud Rate	9600
Data Bit	8
Stop Bit	1
Parity	None
Flow Ctrl	None
PTZ Protocol	
Address	0

Address range: 0~255

2. In the Camera drop-down menu, select the camera for the PTZ setting.
3. Enter the parameters of the PTZ camera.
Note: All the parameters should match the PTZ camera parameters.
4. Click **Copy** if you want to copy the same settings to other PTZ cameras.
5. Click **Apply** to save and exit the interface.

PTZ control

In the Live View mode, press the PTZ Control button on the front panel or on the remote, or choose the PTZ Control icon  to enter the PTZ panel.

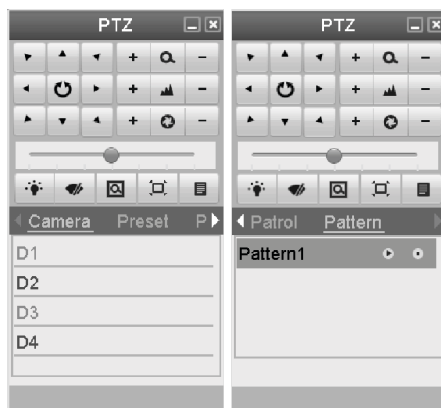





















Table 4: PZT control icons

Icon	Description
	Direction button and the auto-cycle button
	The speed of the PTZ movement
	3D-Zoom
	Patrol
	Previous item
	Stop the patrol or pattern movement
	Zoom+, Focus+, Iris+
	Light on/off
	Image Centralization
	Pattern
	Next item
	Minimize windows
	Zoom-, Focus-, Iris-
	Wiper on/off
	Preset
	Menu
	Start pattern/patrol
	Exit

Playback

Play back the record files of a specific channel in the Live View menu.

Instant playback by channel

Choose a channel under Live View using the mouse, and then click the  button in the shortcut operation menu.

Note: Only the record files recorded during the last five minutes on this channel will be played back.



Playback by channel

To playback by channel:

1. Enter the Playback menu.

Mouse: Right-click a channel in Live View mode and select  from the menu.



Front Panel: Press PLAY to play back the record files of the channel under single-screen live view.

Under multi-screen live view, record files of the selected channel will be played back.

Note: Pressing numerical buttons will switch playback to the related channels for the playback process.

Playback management

The toolbar in the bottom part of Playback interface can be used to control the playback process.



Check the channel or channels if you want to switch playback to another channel, or execute simultaneous playback of multiple channels.

Backup

Recorded files can be backed up to various devices, such as USB flash drives, USB HDDs, or a DVD writer.

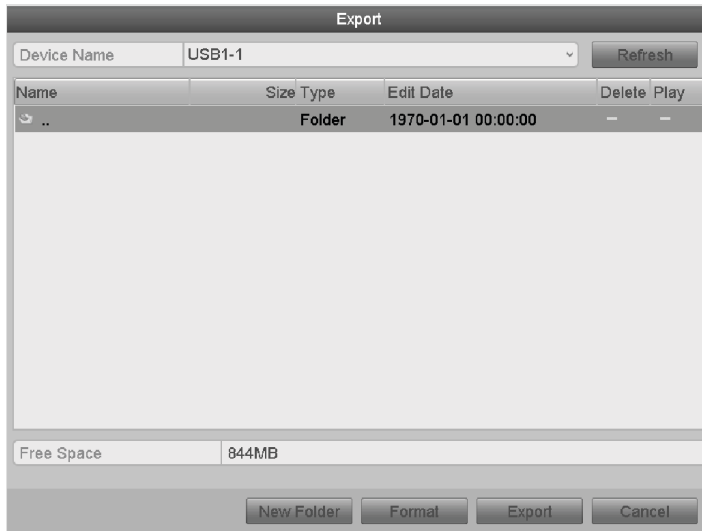
To back up recorded files:


1. Enter the Video Export interface (**Menu > Export > Normal**).
2. Select the channel(s) you want to back up, set the search condition, and then click **Search** to enter the search result interface.

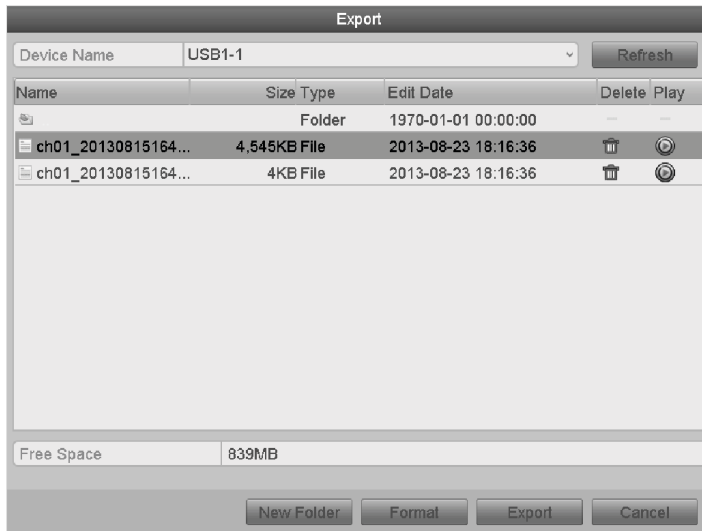
Normal									
<input checked="" type="checkbox"/> IPC	<input checked="" type="checkbox"/> D1	<input checked="" type="checkbox"/> D2	<input checked="" type="checkbox"/> D3	<input checked="" type="checkbox"/> D4	<input checked="" type="checkbox"/> D5	<input checked="" type="checkbox"/> D6	<input checked="" type="checkbox"/> D7	<input checked="" type="checkbox"/> D8	
	<input checked="" type="checkbox"/> D9	<input checked="" type="checkbox"/> D10	<input checked="" type="checkbox"/> D11	<input checked="" type="checkbox"/> D12	<input checked="" type="checkbox"/> D13	<input checked="" type="checkbox"/> D14	<input checked="" type="checkbox"/> D15	<input checked="" type="checkbox"/> D16	
Start/End time of record	2013-07-09 15:02:22 -- 2013-08-23 16:45:03								
Record Type	All								
File Type	All								
Start Time	2013-08-23				00:00:00				
End Time	2013-08-23				23:59:59				

3. In the Search Result interface, select the record files you want to back up, and then click **Export**.
4. Enter the Export interface, choose a backup device, and then click **Export** to start exporting.

Note: You can choose to export the record file(s) and the related log file(s), or the player.



5. Check the backup results. Choose the record file in the Export interface, and then press  to check it.



Understanding camera capacity in an NVR

When setting up your NVR and cameras, you may notice that some of the camera images may not display in Live View. This most often occurs when you are displaying images in 1+5 mode, or 1+7 mode because the total bit rate for all cameras is exceeding the NVR's capacity. The actual capacity depends on the total bit rate from all the cameras. However, it is good practice to allow some headroom for machine operations, such as remote streaming.

NVR model	Capacity
4-channel	20 Mb
8-channel	40 Mb
16-channel	80 Mb
32-channel	160 Mb
64-channel	160 Mb

To fully understand NVR capacity, it is necessary to understand the concepts of streaming video, resolution, quality, and bit rate. Streaming video is content sent in compressed form over a network and processed in real time, that is, as it is received.

Streaming video types

- Main Stream: the high quality video that is being recorded and may be streamed.
- Sub Stream: never recorded; intended for streaming only. Default is 704 × 480, 584 Kbps at 8 fps.
- Can be video alone, or video and audio compressed together. Audio requires very little bandwidth.

The combination of the main stream and sub streams make up the total bit rate of each camera. This is expressed in Kbps (kilobits per second) or Mbps (megabits per second).

Bit rate is determined by the selected resolution (1280 × 720, 1920 × 1080, 2560 × 1920, etc.), frame rate (frames per second), and video quality (the amount of compression being applied to each camera).

Example

32 channels of 720P cameras at 15 fps with good image quality will have $32 \times (1536 + 512) = 65536$ Kbps (about 66Mbps), so the 32-channel NVR can support them.

Each channel can support a different camera, as long as they do not exceed the total bit rate limit. It is entirely possible to mix 5 MP cameras with 4CIF IP cameras, etc. Generally, 5 MP at 30 fps requires around 20 Mbps for best quality. A 4-channel NVR is currently limited to 16 Mbps.

Adjusting settings

Be aware of your NVR's capacity and make adjustments, if necessary. Adjust the bit rate by lowering the resolution, frame rate, or video quality setting.

To adjust the setting:

1. Enter the Live View settings interface.
2. Adjust the Resolution, Frame Rate, and Video Quality settings.

Specifications

Video/Audio input	IP video input	32-ch
	Two-way audio	1-ch, BNC (2.0 Vp-p, 1k Ω)
Video/Audio output	Recording resolution	5 MP /3 MP /1080P /UXGA /720P /VGA /4CIF /DCIF /2CIF /CIF /QCIF
	Frame rate	Main stream: 25 fps (P) / 30 fps (N)
		Sub-stream: 25 fps (P) / 30 fps (N)
	CVBS output	1-ch, BNC (1.0 Vp-p, 75 Ω) Resolution: 704 \times 576 (PAL); 704 \times 480 (NTSC)
	HDMI output	1-ch, resolution: 1920 \times 1080P / 60 Hz, 1920 \times 1080P / 50 Hz, 1600 \times 1200 / 60 Hz, 1280 \times 1024 / 60Hz, 1280 \times 720 / 60 Hz, 1024 \times 768 / 60 Hz
	VGA output	1-ch, resolution: 1920 \times 1080P / 60 Hz, 1600 \times 1200 / 60 Hz, 1280 \times 1024 / 60 Hz, 1280 \times 720 / 60 Hz, 1024 \times 768 / 60 Hz
	Audio output	2-ch, BNC (Linear, 600 Ω)
	Playback resolution	5 MP /3 MP /1080P /UXGA /720P /VGA /4CIF /DCIF /2CIF /CIF /QCIF
Hard disk	Synchronous playback	16-ch
	SATA	4 SATA interfaces for 2 HDDs + 1 DVD-R/W (default), or 4HDDs
	eSATA	1 eSATA interface
	Capacity	Up to 4TB capacity for each HDD
External interface	Network interface	1 RJ-45 10 /100 /1000 Mbps self-adaptive Ethernet interface
		32 independent 100 Mbps PoE network interfaces
	Serial interface	RS-232; RS-485; Keyboard
	USB interface	3 \times USB 2.0
	Alarm in	16
	Alarm out	4

Others	Power supply	100 to 240 VAC, 6.3 A, 50 to 60 Hz
	Consumption (without hard disk or DVD-R/W)	≤ 45 W
	Working temperature	14 to 131°F (-10 to 55 °C).
	Working humidity	10 to 90 %
	Chassis	19-inch rack-mounted 2U chassis
	Dimensions (W × D × H)	17.5 × 15.4 × 3.5 (44.5 × 39.0 × 9.0 cm)
	Weight	≤ 8.82 lb (4 Kg) (without hard disk or DVD-R/W)

